REMARKS

Claims 9-16 are pending in this application. The Examiner's reconsideration of the rejection is respectfully requested in view of the following remarks.

Rejections Under 35 U.S.C. § 103:

Claims 9, 10, 15 and 16 stand rejected under 35 U.S.C § 102(b) as being unpatentable over U.S. Patent to Rha (6,127,241) in view of the U.S. Patent to Yu (5,801,083) and U.S. Patent to Moore (6,051,480) for the reasons stated on pages 2-4 of the Final Office Action. Applicants note that the rejections are being treated as being under 35 U.S.C § 103(a).

Claim 9 recites, *inter alia*, performing heat treatment for hardening and densifying a silicon oxide liner. This step can lower the etch rate of the silicon oxide liner. Applicants respectfully submit that neither Rha, Yu, Moore, nor any combination thereof teaches or suggests the above-claimed feature.

As stated in the Final Office Action, Rha and Yu do not disclose or suggest the heat treatment for hardening and densifying the silicon oxide liner.

Moore does not disclose or suggest performing heat treatment for hardening and densifying the silicon oxide liner. Examiner states that Moore discloses the process of growing of silicon oxide layer (70) (Fig. 1G) and densifying the deposited material by heating in the range of about 900°C (col. 4, lines 57-67). Applicants respectfully disagree that this renders the present invention obvious.

The cited portion reads:

In one embodiment, a sacrificial oxide layer 70 (Fig. 1G) is deposited at step 500 (Fig. 5). The thickness of the sacrificial layer may be about 250Å, for example. In comparison to thermally grown

silicon oxide as a sacrificial oxide layer, deposited oxide can fill grooves and notches in the trench area created during etching. This advantage may further be enhanced by a thermal annealing step (step 550). In this step, the as-deposited oxide layer is subjected to a heat treatment at a temperature above about 900°C to densify the deposited material. Other known thermal annealing methods can be used.

Based on the above, Moore does not disclose or suggest performing heat treatment for hardening and densifying the silicon oxide liner. The silicon oxide liner in the present application is formed in a trench to lower the etch rate of the silicon oxide liner. Thus, the silicon oxide liner of the present application is not removed in a subsequent process. In contrast, Moore discloses a sacrificial oxide layer (70), which is removed in a subsequent process. See Fig. 5, step 650 of Moore. Further, the silicon oxide liner of the present application is formed in the trench (40) and receives a trench filling material. In contrast, the sacrificial layer (70) of Moore is formed over the trench (40). See Fig. 1G of Moore. Accordingly, Moore does not disclose or suggest performing heat treatment for hardening and densifying a silicon oxide liner.

Applicants respectfully submit that there is no suggestion or motivation to combine Moore with the cited references. Indeed, Moore teaches away from their combination. The Examiner states that Moore illustrates that as-deposited sacrificial oxide layer densified at high temperature can enhance filling of grooves and notches in the trench area created during etching. However, in Moore the sacrificial oxide layer (70) is formed over the trench and removed in a subsequent process. Thus, one ordinary skill in the art would not look to Moore to densify a silicon oxide liner formed in a trench.

Thus, claim 9 is not rendered obvious by Rha in view of Yu and Moore.

Claims 10, 15 and 16 depend from claim 9. The dependent claims are believed to be allowable due to their dependency on the allowable base claim 9.

Accordingly, the Applicant respeetfully requests that the Examiner withdraw the rejection of claims 9, 10, 15 and 16 under 35 U.S.C § 103(a) and that claims 9, 10, 15 and 16 are in condition for allowance.

Claim 11 stands rejected under 35 U.S.C § 102(b) as being unpatentable over Rha in view of Yu as applied to claim 9, in further view of U.S. Patent to Oh (6,187,651) for the reasons stated on pages 5 and 6 of the Office Aetion. Applicants note that the rejections are being treated as being under 35 U.S.C § 103(a).

As discussed above, Rha and Yu do not teach or suggest the heat treatment for hardening and densifying the silicon oxide liner, as essentially claimed in claim 9. Oh does not cure the deficiency of Rha and Yu. Based on the above, independent claim 9 is patentable over Rha in view of Yu and Oh. Since claim 11 depends from claim 9, claim 11 is also patentable.

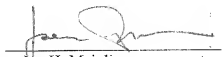
Claims 12-14 stand rejected under 35 U.S.C § 103(a) as being unpatentable over Rha in view of Yu as applied to claim 9, in further view of U.S. Patent to Zheng (5,728,621) and Fukuyama (5,770,260) for the reasons stated on pages 5-7 of the Final Office Action.

As discussed above, Rha and Yu do not teach or suggest the heat treatment for hardening and densifying the silicon oxide liner, as essentially claimed in claim 9. Zheng, whieh is only directed to forming a layer of high density plasma oxide (HDP) by chemical vapor deposition (CVD), does not cure the deficiency of Rha and Yu. Further, Fukuyama, which is only directed to a process for forming a silicon dioxide film, does

not cure the deficiency of Rha, Yu and Zheng. Based on the above, independent claim 9 is patentable over Rha in view of Yu, Zheng and Fukuyama. Sinee claims 12-14 depend from claim 9, claims 12-14 are also patentable.

For the foregoing reasons, the present application is believed to be in condition for allowance. The Examiner's early and favorable action is respectfully requested. The Examiner is invited to contact the undersigned if he has any questions or comments in this matter.

Respectfully submitted,

By: 

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